

REMARKS

The Office Action dated February 22, 2010, has been received and carefully noted. The above amendments to the specification, the claims, and the following remarks, are submitted as a full and complete response thereto.

In accordance with the foregoing, the specification and claims 1 and 5 have been amended to more particularly point out and distinctly claim the subject matter of the invention and claims 9 and 10 have been added. The specification has been also amended to improve the translation from the original Japanese specification JP Application 2004-362065 (JP 2006-167847) to English application PCT/JP 2005020932. No new matter is being presented, and approval and entry are respectfully requested. Support for the amended description in the Specification may be found, at least, in FIG. 1 and Japanese specification JP Application 2004-362065 (JP 2006-167847), from which the present application claims priority. Support for the amended features in claim 1 may be found, at least, on page 14, line 4, to page 15, line 8. Lastly, support for new claims 9 and 10 may be found, at least, on page 8, line 22, to page 9, line 4, and page 14, line 4, to page 15, line 8. As will be discussed below, it is also requested that all of claims 1-10 be found allowable as reciting patentable subject matter.

Applicants are grateful for the indication that claims 5 and 7 contain allowable subject matter, and would be allowable if amended to be in independent form. Accordingly, claim 5 has been rewritten in independent form including the base claim from which it depends. Claim 7 depends from new independent claim 5. Thus, it is

respectfully submitted that claims 5 and 7 are reconditioned for allowance.

Claims 1-10 are pending and under consideration.

REJECTION UNDER 35 U.S.C. § 102:

Claims 1-2, 4, and 6 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over U.S. Patent No. 4,300,362 of Lande *et al.* (“Lande”) in view of U.S. Patent No. 5,797,900 of Madhani *et al.* (“Madhani”). The Office Action took the position that Lande discloses all of the features of claim 1, except that the first and second motor have output shafts orthogonal to the link. The Office Action cited Madhani to remedy this deficiency of Lande. It is respectfully asserted that, for at least the reasons provided herein below, Lande and Madhani, individually or combined, fail to teach or suggest the recitations of the pending claims. Reconsideration is requested.

Independent claim 1, upon which claims 2-4, 6, and 9 are dependent, recites a joint structure to be connected to an assembly and a link of a robot. The joint structure includes a first motor configured to cause the assembly to swing in a longitudinal motion with respect to the link, and a second motor configured to cause the assembly to swing in a lateral motion with respect to the link. The first motor and the second motor are disposed so that the rotation output shaft of the first motor and the rotation output shaft of the second motor are parallel with each other and are orthogonal to the link.

As will be discussed below, Lande and Madhani fail to disclose or suggest the elements of any of the presently pending claims.

Lande generally relates to articulation for a manipulator arm. The embodiment shown in Figure 4 of Lande appears to have two jacks 13B and 13C that can articulate disk 35 both with a lateral motion and a longitudinal motion, respectively.

The Office Action appears to have treated jacks 13B and 13C as motors and attempted to make them correspond to the claimed “first motor” and “second motor” respectively. However, as explained at column lines 49-58 of Lande, jacks 13B and 13C are not motors, but instead are hydraulic jacks. Thus, contrary to the Office Action, Lande does not and cannot disclose “first motor” and “second motor” as recited in claim 1.

Additionally, as the Office Action acknowledged, Lande fails to disclose that jacks 13B and 13C have rotation output shafts orthogonal to a link to which they are connected. Claim 1, however, recites in part, “the first motor and the second motor are disposed so that the rotation output shaft of the first motor and the rotation output shaft of the second motor are parallel with each other and are orthogonal to the link.”

The Office Action cited Madhani to remedy this deficiency of Lande. Madhani generally relates to a wrist mechanism for a surgical instrument for performing minimally invasive surgery with enhanced dexterity. In Madhani, there are no motors or hydraulic jacks at the wrist joint. Madhani, however, does employ five motors M1-M5 (see Figure 3). The motors (M1-M5) include several motors whose output shafts (see, for example, Figure 4, drive shaft capstan 93) are parallel to one another and orthogonal to the link to which they are apparently attached.

There appears to be no particular reason why one of ordinary skill in the art would seek to combine the feature of the arrangement of the motors in Madhani with the disclosure of Lande to arrive at something corresponding to what is recited in claim 1.

First, the motors of Madhani are not an obvious substitute for the hydraulic jacks of Lande because their method of operating is different. Hydraulic jacks behave differently than motors. Second, even if the substitution of motors for jacks were obvious, Madhani's motors are not located at the joint. Thus, if Madhani's motors were somehow substituted for Lande's hydraulic jacks, there is no reason one of ordinary skill in the art would follow Madhani's placement of the motors (as to being orthogonal to the link) while ignoring Madhani's placement of the motors as to the displacement from the joint. Likewise, if one of ordinary skill in the art were following Madhani's use of motors, there is no obvious reason for one of ordinary skill not also to follow the joint mechanism that Madhani provides, which does not involve a first motor moving the joint in a longitudinal direction and a second motor moving the joint in a latitudinal direction.

In short, the selection of the orthogonal placement of Madhani's motors has been made arbitrarily in view of the present application's disclosure. Such a selection is an example of inappropriate hindsight reconstruction. For a proper rejection under 35 U.S.C. 103(a), there must be some reason, such as teaching, motivation, or suggestion, that would lead one of ordinary skill in the art to make the combination.

The Office Action took the position that it would have been obvious "to modify Lande to include drive motors arranged orthogonally to the robot link for the desired

purpose of providing a dexterous, low friction and low inertia robot joint.” While Madhani in its entirety may accomplish such an objective, Madhani does not indicate that such an objective is accomplished (in whole or in part) by the orthogonal placement of the drive motors. Furthermore, one of ordinary skill in the art would not have a reasonable expectation of success in making the joint of Lande more dexterous, low friction, or low inertia simply by altering the orientation of hydraulic jacks 13B and 13C.

The Office Action further argued that the orientation of the motors is a matter of engineering design. However, engineering design is not a reason for any particular orientation to be used. Nor is engineering design a reason why one of ordinary skill in the art would have modified Lande, particularly since (according to the Office Action) “the orientation of the motors is a matter of engineering design selection dependent on the power transfer device selected” and evidently the power transfer device selected in Lande does not require an orientation corresponding to what is claimed. Thus, even if the Office Action’s discussion regarding engineering design is accurate (although there is no evidence of record to support it), the Office Action’s discussion regarding engineering design supports the non-obviousness of the claimed invention.

The Office Action argued that “the claims require the motors to be configured to rotate” there is no positive recitation of structure.” In response to this, the output shafts of the first and second motor are further specifically defined as “rotation output shafts”. The amended claim 1 features the rotation output shafts. This is supported by description on page 14, L4 and page 15, L8. Lande fails to disclose this feature. In Lande, the

actuator is hydraulic jacks 13B and 13C and the shaft 12B is indicated to move in a thrust direction. (Emphasis added) Accordingly, Lande fails to disclose the rotation output shaft.

Independent claim 10 has its own scope, recite features similar to those recited in amended independent claim 1. For at least the reasons discussed above, Applicants respectfully submit that Lande and Madhani fails to disclose or suggest all of the features of claims 1 and 10 and related dependent claims. Accordingly, Applicant respectfully requests that the rejection of claims 1 and 10 and related dependent claims be withdrawn.

Reconsideration and allowance of claims 1 and 8 are, thus, respectfully requested.

Claims 3 and 8 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Lande in view of Madhani, as applied to claims 1-2, and further in view of U.S. Patent No. 5,732,599 of Iriyama (“Iriyama”). The Office Action took the position that the combination of Lande and Madhani discloses most of the features of the claims, but cited Iriyama to remedy deficiencies of the combination of Lande and Madhani with respect to “an elastic member configured to generate a force between the movable cover and at least one of the assembly and the robot link, and place the moveable cover in a predetermined position.” It is respectfully asserted that, for at least the reasons provided herein below, Lande, Madhani, and Iriyama, individually or combined, fail to teach or suggest the recitations of the pending claims. Reconsideration is requested.

Claims 3 and 8 depend on claim 1. At least some of the deficiencies of the combination of Lande and Madhani with respect to claim 1 are discussed above. Iriyama does not remedy the above-identified deficiencies of the combination of Lande and Madhani.

Iriyama generally relates to an industrial robot. However, there is nothing in Iriyama that would have led one of ordinary skill in the art to arrive at the claimed invention in which “the first motor and the second motor are disposed so that the output shaft of the first motor and the output shaft of the second motor are parallel with each other and are orthogonal to the link,” as recited in claim 1. Thus, the combination of Lande, Madhani, and Iriyama fails to disclose or suggest all of the elements of any of the presently pending claims.

For at least the reasons discussed above, Applicants respectfully submit that Lande, Madhani, and Iriyama fails to disclose or suggest all of the features of claim 1 and related dependent claims 3 and 8. Accordingly, Applicant respectfully requests that the rejection of dependent claims 3 and 8 be withdrawn.

CONCLUSION:

In view of the above, Applicants respectfully submit that the claimed invention recites subject matter which is neither disclosed nor suggested in the cited prior art. Applicants further submit that the subject matter is more than sufficient to render the claimed invention unobvious to a person of skill in the art. Applicants therefore

respectfully request that each of claims 1-4, 6, and 8-10 be found allowable and, along with allowed claims 5 and 7 , this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time.

Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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